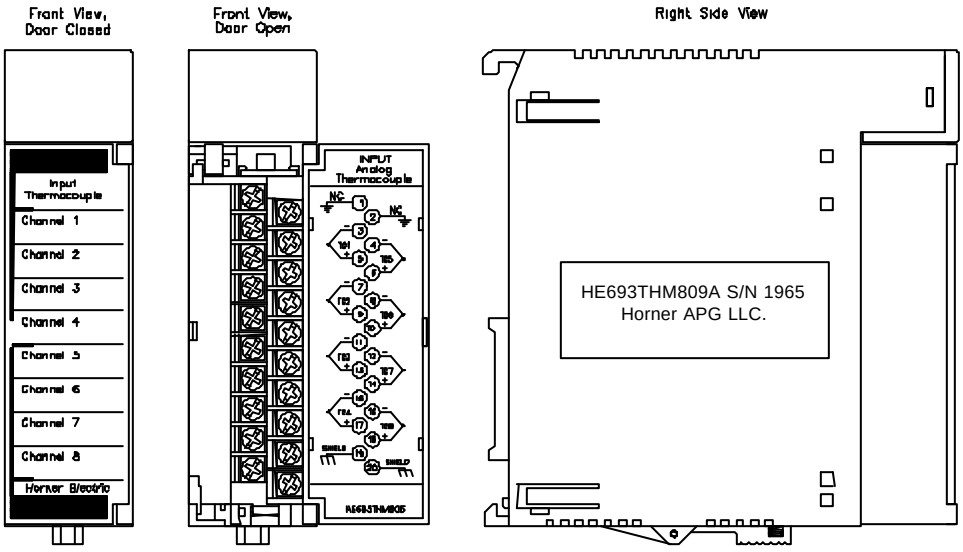
Thermocouple Input Module

Product Specifications and Installation Data

1 DESCRIPTION

The Horner APG Thermocouple Input Modules allow thermocouple temperature sensors to be directly connected to the PLC without external signal processing (transducers, transmitters, etc.). All analog and digital processing of the thermocouple signal is performed on the module. These modules have a resolution of 0.5°C, and temperature values may be reported to the PLC %AI I/O table in 0.5°C or 0.5°F increments. There are four standard resolution models available, with four input channels (HE693THM409/HE693THM449), and with eight input channels (HE693THM809/HE693THM889). All models feature open circuit detection, where the temperature value written to the %AI register goes to its maximum value upon an open circuit condition. Two models (HE693THM449 and HE693THM889) also feature %I alarm bits which energize on an open circuit condition. The first four %I bits are used for the HE693THM449 and the first eight %I bits are used for the HE693THM889.



2 SPECIFICATIONS

Table 1 – Specifications					
Specification	**THM409[449]**	**THM809[889]**	**Specification**	**THM409 [449]**	**THM809 [889]**
Power Consumption	70mA @ 5VDC and 60mA @ 24V Relay		I/O Points Required	4%AI, [& 16%I]	8%AI [& 16%I]
Number of Channels	4	8	Input Impedance	>20Mohms	
Types Supported	J, K, N, T, E, R, S,		Maximum Safe Overload	+/- 35V	
Input Range (Temp) (J, K, N, T, E, R,S)	J: -210 TO +760°C	E: -270 to +1000°C	Common Mode Range	+/- 12V	
	K: -270 to +1372°C	R: 0 to +1768°C	Common Mode Rejection	>100dB	
	N: -270 to +1300°C	S: 0 to +1768°C	A/D Conversion Type	Integrating	
	T: -270 TO +400°C		A/D Conversion Time	5 ms	
Resolution	0.5°C		Operating Temperature	0 to 60°C (32 to 140°F)	
Accuracy	+/- 0.5°C typical (Type J)		Relative Humidity	5% to 95% non-condensing	

3 CONFIGURATION

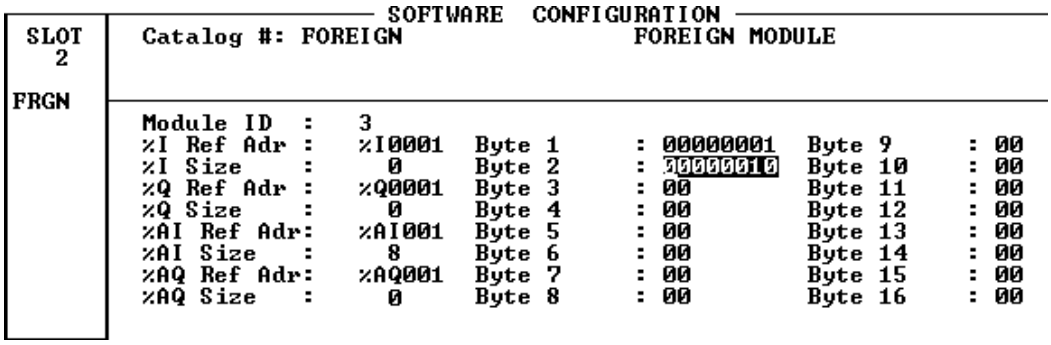


Figure 2 - Foreign Module Configuration

To reach this screen, select I/O Configuration (F1), cursor over to the slot containing the module and select Other (F8), and Foreign (F3). This configuration is for the HE693THM809.

Table 2 – Configuration Parameters							
Model	%AI Size	%I Size	Byte				
			1	2	3	4	5
THM409	4	0	1	(see chart)	0: 0.5°C 1: 0.5°F	0	00: J 01: K 02: N 03: T 04: E 05: R 06: S
THM449		16					
THM809	8	0					
THM889		16					

Byte 2 sets digital filtering, Byte 3 sets temperature units, and Byte 5 sets the thermocouple type.

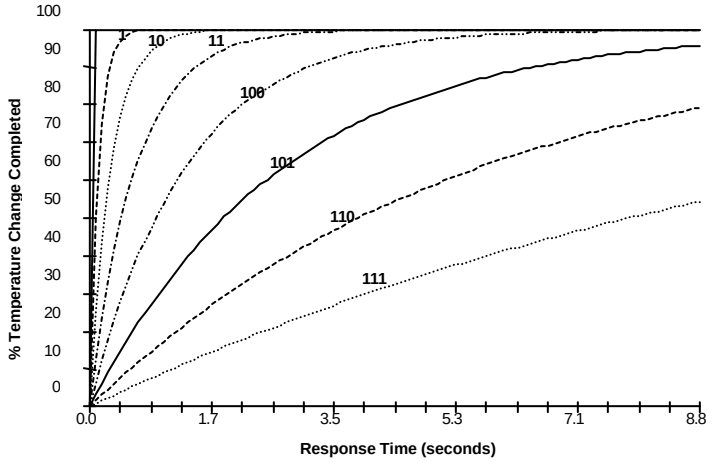


Figure 3 - Digital Filtering

The effect of digital filtering (set with Byte 2) on module response to a temperature change. (% temp change completed vs. time).

Table 3 – Temperature Scaling	
Byte 3	Formula
0	°C = %AI / 2
1	°F = %AI / 2

Temperature values are written to the %AI registers in 0.5°C or 0.5°F increments, depending upon the value of Byte 3.